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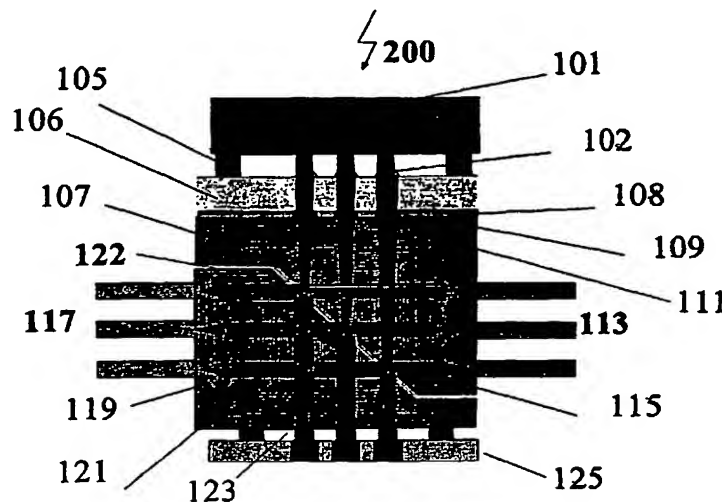
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(54) Title: **MULTI-PORT OPTICAL AMPLIFIER WITH VCSEL PUMP ARRAY AND GAIN CONTROL**



(57) Abstract: An optical amplifier (200) has input means (117) and pump beam generating means (101). Waveguide means (113), such as Erbium-doped fibres, receive the input signal and output amplified signals. The amplifier (200) may have more than 64 input/output ports, and the pump generating means (101) may comprise an array of vertical cavity surface emitting lasers. Gain may be controlled by monitoring input signal and pump powers, and adjusting the pump driving current profile accordingly.